



Environmental stewardship: **our commitment in action**

2017



NorthWestern[®]
Energy

Delivering a Bright Future

On the cover. Top photo shows Mystic Lake from a trail above our dam that supplies hydro power to our two-unit 12-megawatt plant located on the West Rosebud Creek in the Beartooth Mountains, about 75 miles southwest of Billings, Montana. On the right, Sady Babcock, environmental permitting specialist, inspects the right of way where crews worked on a line clearance project in Lolo National Forest along the Idaho-Montana border. Bottom photo is a dog enjoying the restored bank and waters of O'Dell Creek south of Ennis, Montana.

Vision

Enriching lives through a safe, sustainable energy future.

Mission

Working together to deliver safe, reliable and innovative energy solutions.

Values

Safety: We strive to do our jobs safely every day, without fail and without exception. We

ensure the safety of our customers, the environment and the public through proper maintenance of our equipment and strict adherence to our belief in maintaining a safe working environment.

Excellence: We aim to achieve the highest levels of satisfaction, reliability and performance in everything we do. We're always striving for improvement and questioning the status quo.

Respect: Every employee is treated with dignity and fairness. Personal advancement is related to personal performance.

Value: We are committed to providing shareholders with returns that are among the best in our industry. Value to our customers comes through the products and services we deliver at prices that illustrate our focus on quality, efficiency and productivity.

Integrity: We adhere to ethical business practices and are honest and transparent in our actions.

Community: Our success is tied to the success of each and every one of our communities. We aim to be a good corporate citizen through the contribution of our time, talent and resources to help our communities fulfill their vision of success.

Environment: We are committed to providing all customers with utility services that meet their current and future needs, while protecting and enhancing the quality of the environment. We will utilize our limited natural resources wisely and act responsibly to limit impacts on our air, water and land resources.

NorthWestern Energy's environmental policy and principles

NorthWestern Energy's policy is to provide cost-effective, reliable and stably priced energy while being good stewards of the natural resources and complying with environmental regulations.

We apply the following environmental principles in our day-to-day business:

1. Our business practices reflect a respect for, and a commitment to, sustainability and the long-term quality of the environment.
2. One of our priorities is being good stewards of natural and cultural resources at our hydroelectric projects.
3. We comply with the spirit as well as the letter of environmental laws and regulations.
4. Environmental issues and impacts are an integral part of our planning, operating and maintenance decisions.
5. We promote our customers' efforts to conserve energy.
6. We support providing energy through non-carbon emitting and renewable resources when consistent with our statutory requirement to provide cost-effective energy.
7. We strive to minimize the generation of wastes and promote the reuse and/or recycling of materials.
8. We seek to improve our environmental compliance and stewardship continuously.
9. We embrace a team culture where positive environmental stewardship and compliance are encouraged, mentored and rewarded.
10. Our contractors and consultants must comply with this policy when working for or representing NorthWestern Energy.

About this Report

This report profiles NorthWestern Energy's stewardship efforts and commitment to the quality of the environment. It is our second annual report dedicated primarily to environmental activities. If you have comments or questions about the content published here, please contact Mary Gail Sullivan at 406-497-3382 or marygail.sullivan@northwestern.com.

Message from Bob Rowe, president & CEO



Bob Rowe

We are stewards of essential infrastructure and service for our customers and communities. We also are stewards of the environment in which we both work and live.

Our environment – from the mountains of Montana and Yellowstone Park to the plains of South Dakota and Nebraska – defines us while the snows, winds and rains, and the stunning rivers and lakes connect us. We understand that our business interacts with the world around us, and that our use of natural resources is a privilege.

We support and are encouraged by the projects and programs highlighted in this report. The heart of our electric generation in Montana is our hydro system that is an environmental, recreational and cultural asset for the state and indeed for the nation.

As I travel along the Madison, Missouri or Clark Fork Rivers, as well as across the rest of our service territory, I reflect on our responsibilities and am proud of what our employees do, working together with the resource agencies and the communities we serve. As you read in this report about our low-carbon electric supply sources; our efforts to prevent or address air, water and soil impacts; our fish and wildlife studies and mitigation projects; our environmental stewardship programs; our new environmental management system; and our daily commitment to protect the environment, we hope you will see what I mean.

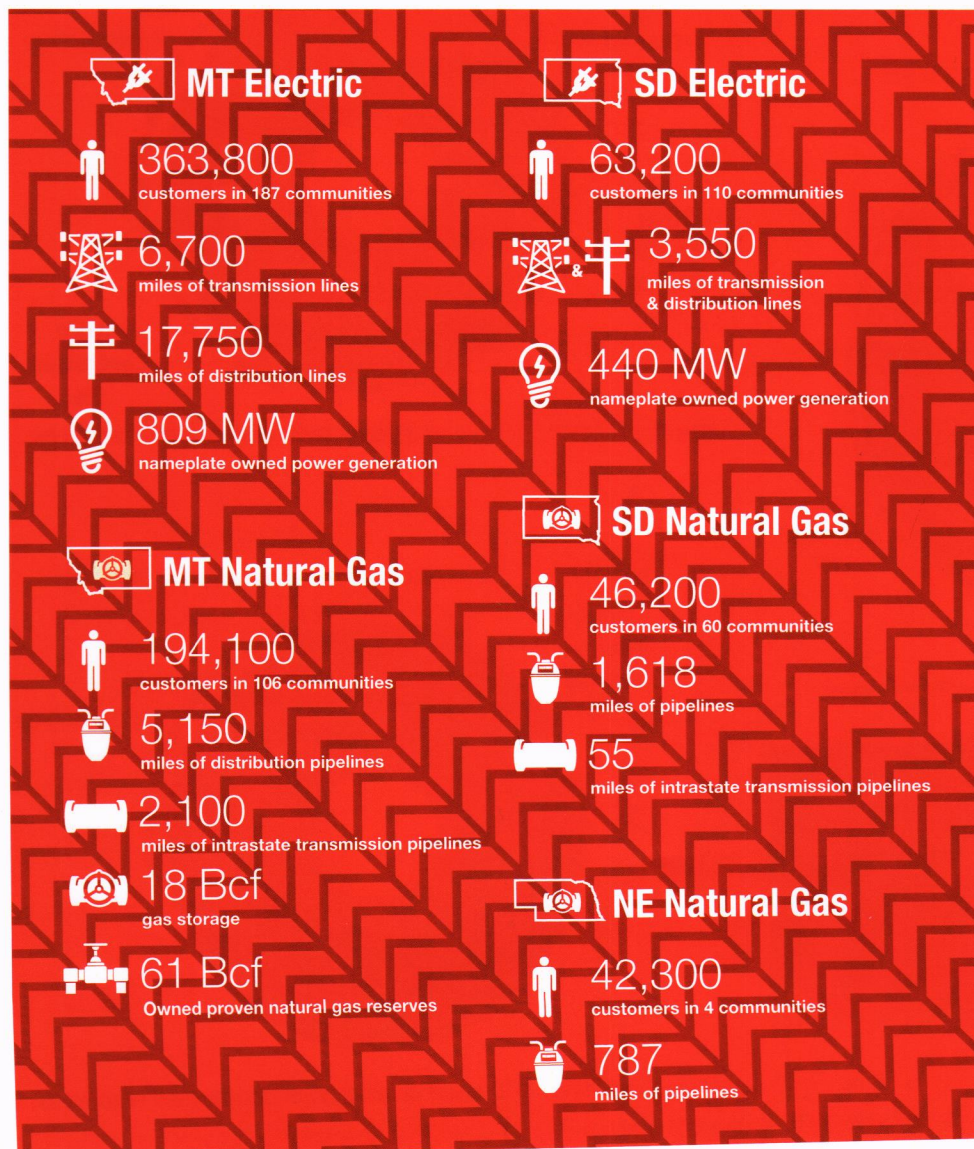
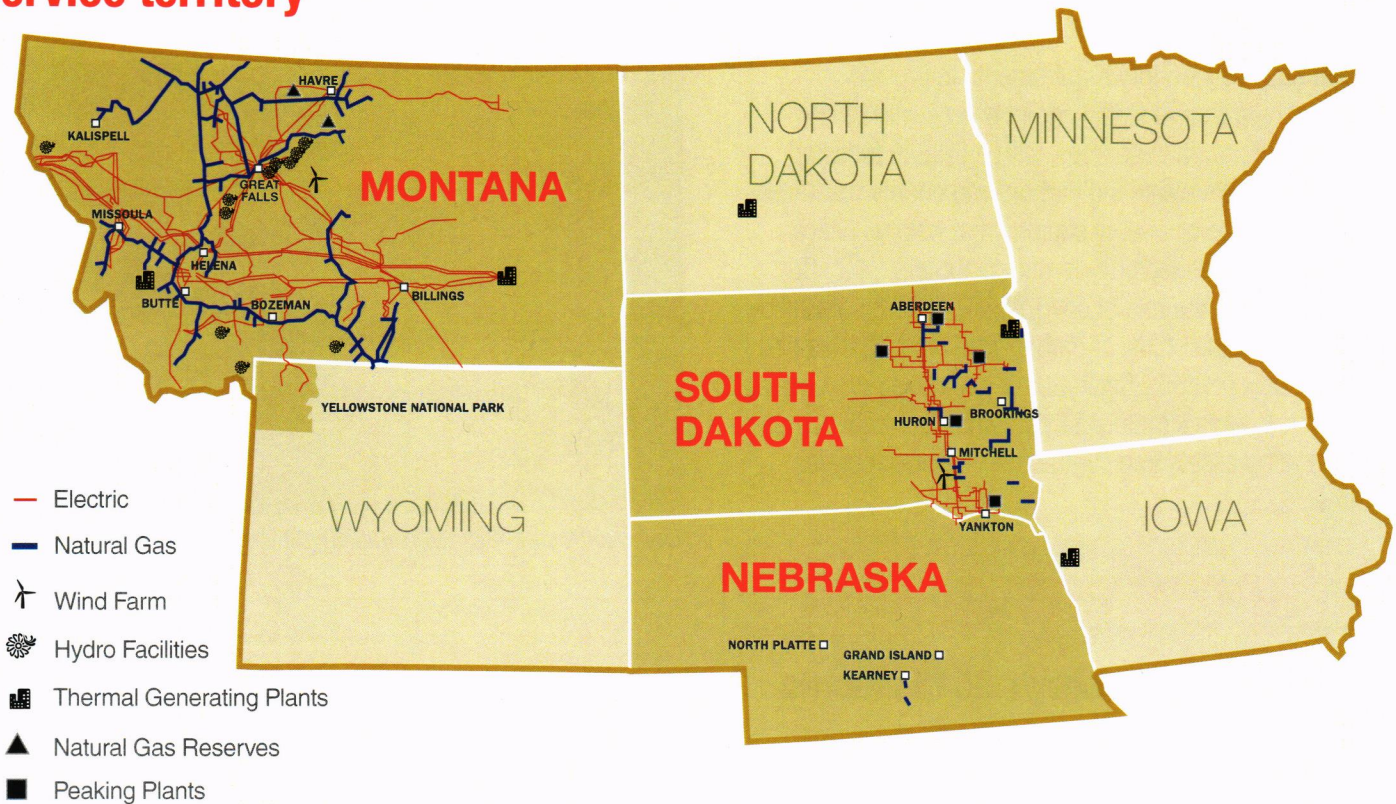
Table of Contents

Service territory	5
Leading the way on clean energy	6
Focusing on energy conservation and recycling	11
Protecting the environment through stewardship and compliance	12
Contact us	30

Acknowledgements

Many NorthWestern Energy employees throughout the company contributed time to the activities highlighted here along with the work to design and produce a final report. Thanks to all out employees for their professional contributions, especially those in Environmental Permitting and Compliance, Creative Services and Human Resources.

Service territory



Providing reliable, safe and secure energy

NorthWestern Energy owns a mix of clean and renewable energy resources balanced with traditional energy sources that help us deliver affordable and reliable electricity to our customers 24/7.

We own, operate and maintain 28,000 miles of electric lines in Montana and South Dakota, serving close to 427,000 electricity customers. In addition, we provide energy to Yellowstone National Park and its millions of visitors annually. For our 282,600 natural gas customers in Montana, South Dakota and Nebraska, we operate 8,092 miles of natural gas pipelines in a manner that ensures reliable, continuous delivery of natural gas while maintaining public safety and the integrity of the gas pipeline.

Leading the way on clean energy

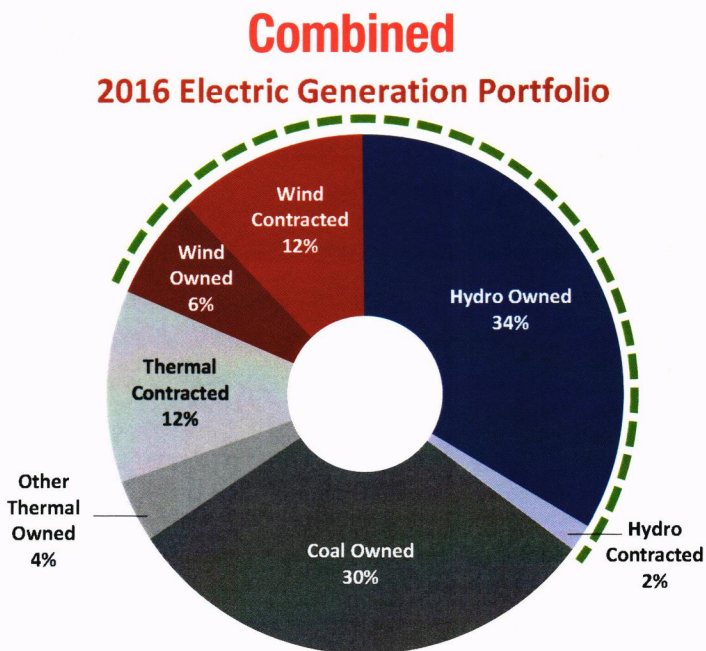
We strive to balance statutory requirements to provide cost-effective, reliable and stably priced energy with being good stewards of natural resources, with a diligent focus on sustainability. We own clean and carbon-free energy resources balanced with traditional energy sources that help us deliver affordable and reliable electricity to our customers 24/7. Our policies support both the role of cost-effective energy efficiency and the potential value of low or carbon-free resources as part of our diverse supply portfolio. Since 2016, and based on megawatt hours generated, approximately 54 percent of our total company-owned generating assets and contracted electric supply is carbon-free.



Our Thompson Falls hydro facility on the Clark Fork River.

A balanced energy mix

NorthWestern Energy's 2016 electric portfolio based on MWh Delivered



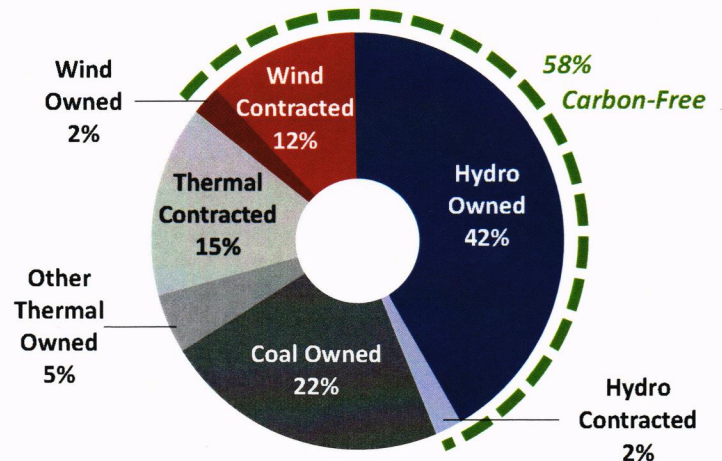
Based on MWh of owned & long-term contracted resources



A wind farm in central Montana.

Montana

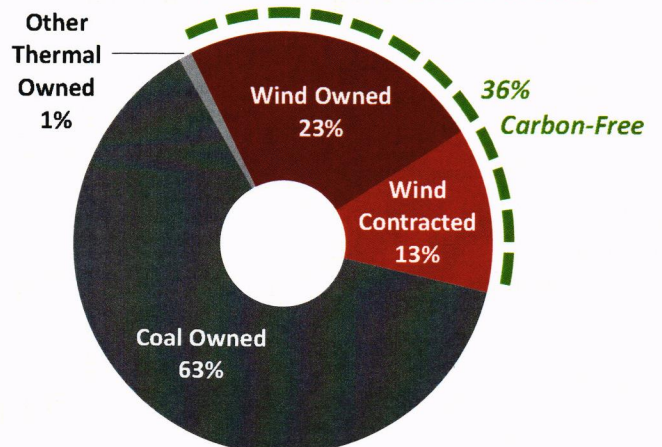
Montana 2016 Electric Generation Portfolio



Based on MWh of owned & long-term contracted resources

South Dakota

South Dakota 2016 Electric Generation Portfolio



Based on MWh of owned & long-term contracted resources

Carbon footprint

NorthWestern Energy is committed to enhancing the environmental attributes of its balanced, safe and reliable energy mix and to being consistent with current regulatory and statutory directives. Over the past five years, we have reduced our carbon footprint dramatically from our electric portfolio. During 2014 and 2015, we acquired more than one billion dollars of clean energy, including 11 hydroelectric plants totaling 439 MW in Montana and an 80-MW wind energy plant in South Dakota. Since late 2016, we also have signed nine long-term renewable energy supply contracts with third-party wind and solar developers, adding up to 278 MW of new clean energy.

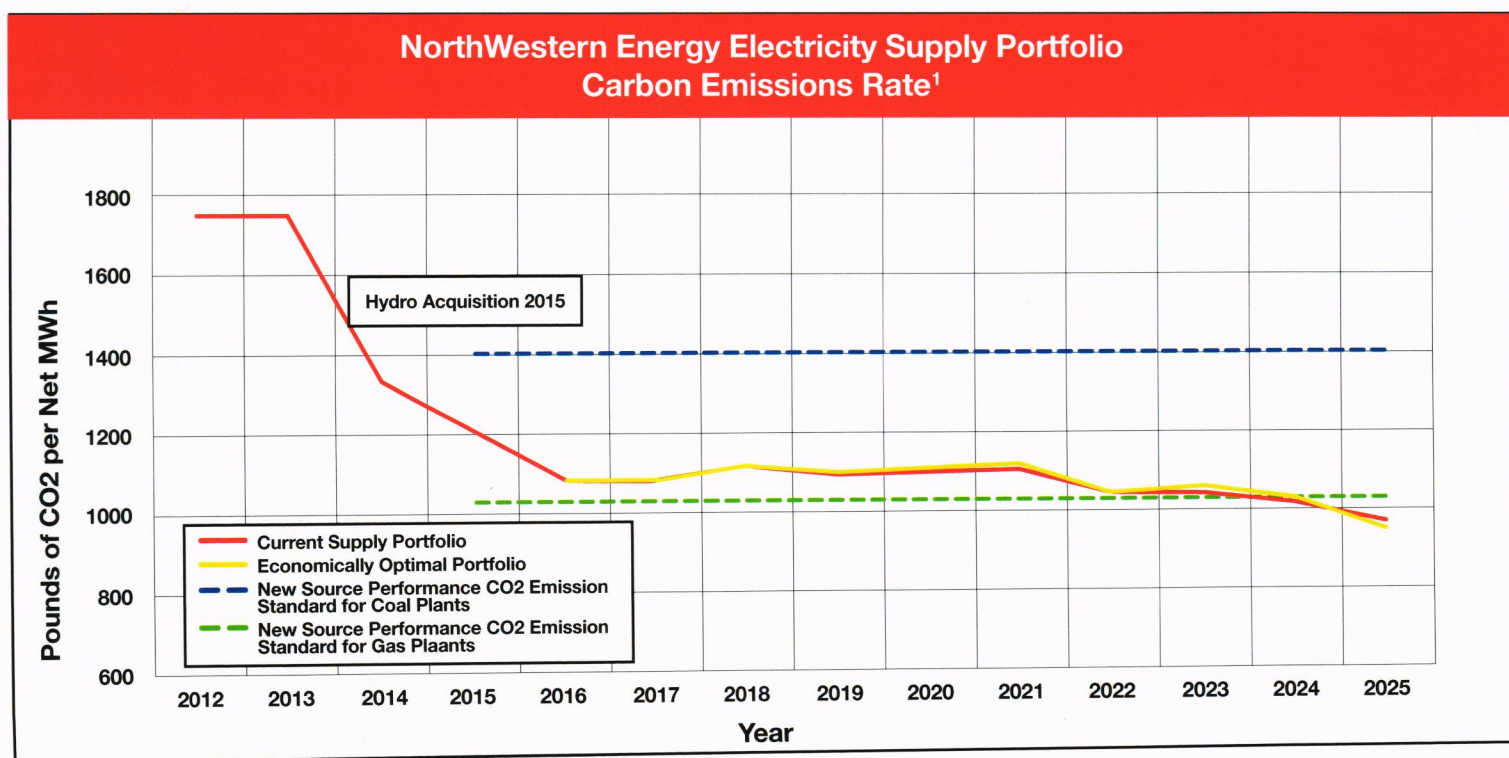
The graph below indicates our calculated carbon-emission rate for our Montana Electricity Supply Portfolio since 2012 and the anticipated carbon-emission rate through 2025 based on the assumptions included in our 2015 Electricity Supply Resource Procurement Plan (Plan). For comparison, the graph also shows the allowable carbon emission rates for new fossil fuel-fired steam plants (coal plants) and new natural gas-fired combined cycle plants based on the current regulations.

We update our Montana energy mix carbon emission calculations each year using data from the energy resources from the previous year. Every two years we go through an energy resource planning process to prepare a new Plan, looking ahead 20 years and evaluating the needs required to serve our customers safely, reliably and cost-effectively and to identify various options to fill

those needs. We then update our carbon-emissions predictions based on the energy sources in the new Plan.

The value of the Montana hydro system to our customers and communities cannot be overstated. Unlike other renewables, it contributes both energy and capacity as well as additional or ancillary services. Thanks to the hydro system, pounds of carbon per net MWh or generation on our system today are substantially lower than would have been required under the Environmental Protection Agency Clean Power Plan target for Montana in 2030. Mainly through upgrades under current FERC license requirements, the hydro system also has potential to add cost-effective supply at existing dams. In addition, our hydro system provides significant environmental and recreational amenities, including contributing to the quality of fish and wildlife habitat. Because the system forms the riparian arteries for much of Montana, we also embrace additional environmental stewardship opportunities, as described in this report.

Our South Dakota electric operations are included in the Southwest Power Pool (SPP), which is a regional transmission operator that manages the bulk power grid and wholesale power market in the central United States on behalf of a group of utilities and transmission companies in 14 states. The carbon emission rate associated with providing electric service to our South Dakota customers is dependent on the mix of pooled energy resources in the SPP delivered to serve our customers.



¹ Future rates will be updated based on the 2018 Electricity Supply Resource Procurement Plan.

² See NorthWestern Energy's 2015 Electricity Supply Resource Procurement Plan for a description and explanation of each portfolio.

³ See 40 CFR Part 60 Subpart TTTT - Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units (lbs/MWh-g)

Private generation

Private generation refers to the generation of energy at the site of consumption, like private solar panels on a house, as compared to energy generation at an offsite location, like a wind farm.

At the end of 2016, we had approximately 1,900 individuals or business using private generation connected to our systems. A summary of these private generation resources in Montana, including the number of systems and installed kilowatt (kW) capacity for solar and wind resources is shown in the table on the right.

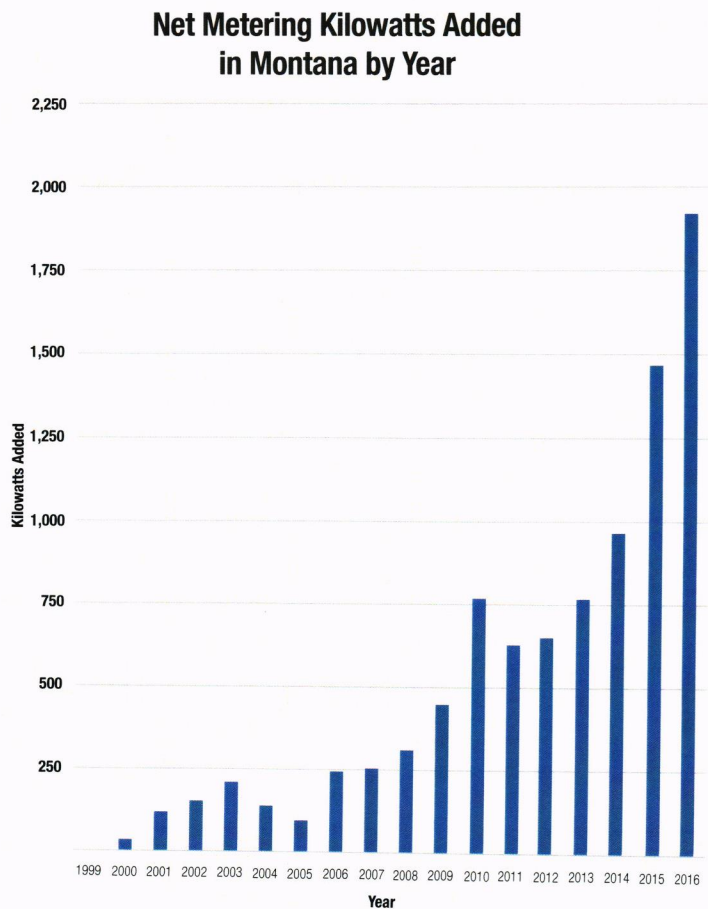
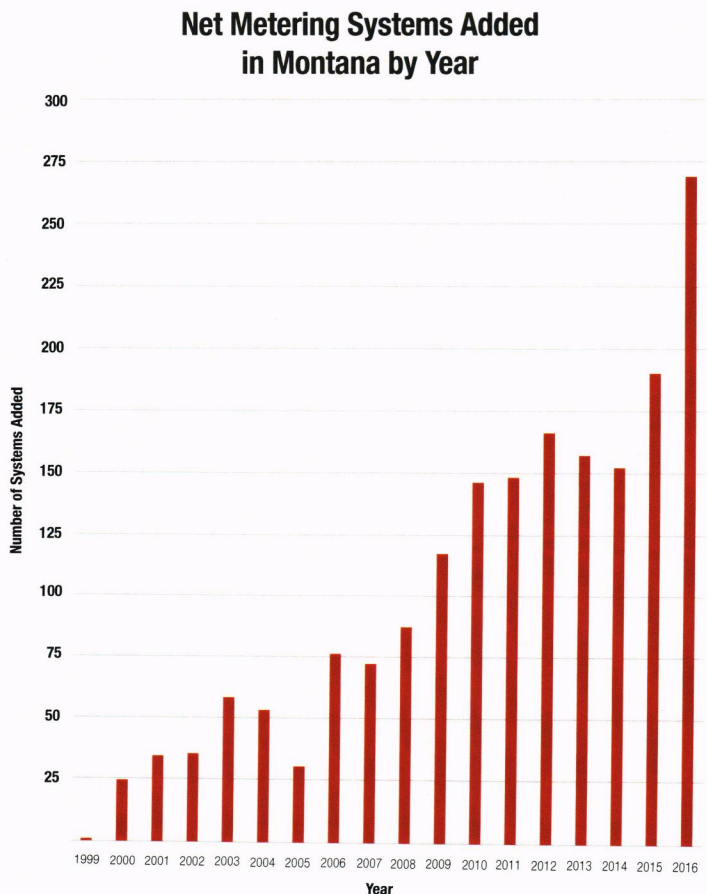
		Installed Capacity (Kilowatts)	
Customer Class	Number of Systems ^{1,2}	Solar	Wind
Residential	1,426	5,457	421
Commercial	437	2,823	456
Total	1,863	8,280	877
Note 1. Some customers have multiple types of systems at their premise (e.g., wind and solar). Each system is counted as a unique system even if owned by only one customer.			
Note 2. In addition, in Montana, there are 3 micro-hydro systems totaling 14.5 kW of capacity and, in South Dakota, there are two solar systems and one wind system, each less than 10 kW of capacity			

Private generation credits in Montana

Each private generation customer is charged only for kilowatt-hours (kWh) they use from our system but we credit them for any energy they return to the grid in excess of the amount they used. The credit on their bill is at the full retail rate, including the costs of generation, transmission and distribution. Since July 1999, Montana has had in place a law for private generation credits, giving eligible private generation resources a capacity up to 50 kW generated through solar, wind or hydropower. The state of Montana refers to the law as a net metering law.

Montana law does not establish any cumulative installed capacity limits. As defined by the law, energy companies may not require

private generation customers to comply with any additional standards or requirements beyond those established by certain specified national safety standards and electrical organizations. Montana's law also does not permit community or virtual net metering or aggregating multiple accounts from one customer. Much has changed since implementation of this policy in 1999, when the cost for solar and other renewable resources was prohibitive and required incentives to survive. Interconnection policies are under consideration and review the Montana Public Service Commission.



Private generation credits in South Dakota

Currently we have only three private generation customers on our system in South Dakota, and state law allows for the sale of private generation but does not allow for private generation credits. Our South Dakota electric tariff offers two rate schedules that permit a customer-owned or operated private generation

resource of 100 kW or less to sell the electricity it generates onto our system. Of our approximately 62,800 electric customers in South Dakota, we have two solar customers using the time-of-day rate schedule and one wind customer using the flat-rate schedule. The capacity of each facility is less than 10 kW.

Solar generation

Our vision is to enrich lives through a safe sustainable energy future. We are committed to providing more clean energy, delivered more reliably and more affordably than ever before. Besides the hydro and wind in our electric portfolio, we are expanding our analysis and use of large utility-scale solar called universal solar. As such, we are working actively with our regulators, the Montana Legislature and other stakeholders to update energy policies. We are looking for the most cost-effective ways to support the use of solar that are appropriate to the needs of our customers and our supply portfolio with its clean hydro assets, that are fair to all customers, and that are sustainable long term and at scale.

We provide funding for solar projects less than 50 kW through the Universal System Benefits (USB) program and for solar projects of less than 3 megawatts that qualify to be part of our supply mix. For more than 17 years, we have helped to fund installation of more than 1,176 solar photovoltaic and wind systems of various sizes through our USB program in Montana.

Our Beck Hill Rural Microgrid Project is located just outside of Deer Lodge, Montana. It uses 40.26 kW of solar generation paired with 80 kW/230.4 kWh of battery storage and automated equipment to provide backup energy to customers at the end of a rural feeder.



Our project just east of Bozeman, Montana, features a solar array of photovoltaic collectors.

Through the project, we are evaluating energy storage and the ability of solar photovoltaic collectors to increase rural reliability and to provide ancillary services. Since the project's installation in October 2015, the microgrid has successfully operated during six tests and through four outages.

In the fall of 2016, we completed construction of the Bozeman Solar Project located in Bozeman, Montana. This project is a 385 kW solar system that gathers data to evaluate community solar models and tests the applications of advanced inverters. We will use data from this project to help determine the value of solar to the energy grid. This project is a partnership between the City of Bozeman, Montana State University and Schweitzer Engineering Laboratories. We have designed it to have an energy output of about 533,000 kilowatt-hours per year. Along with solar photovoltaic panels and advanced inverters, the project also involves the installation of 40 residential and 20 commercial advanced meters to help us better understand how solar power aligns with customer needs.

Both of our current solar projects involve Montana State University students through senior design projects. During the past school

year, six engineering students studied the controls of advanced inverters. They also studied ways to make the most of the orientation of solar panels to align the generation with customer loads. In the year prior, the students studied the operation of our Beck Hill pilot project. Their research demonstrated insights into increasing the efficiency of the projects.

In Missoula, Montana, we currently are developing another renewable energy pilot project that will likely involve the installation of solar technology, possibly including energy storage, at public school locations in the Missoula area. The collaborative solar energy project between NorthWestern Energy, the City of Missoula and the local school district also will provide educational opportunities for students and members of the community. We are still discussing the exact details and locations, but we expect the pilot to be operational the first quarter of 2019.

As was the Bozeman solar pilot, the Missoula project is another example of a project, resulting from a yearlong working group that provided input and helped develop priorities as we work to become a next-generation energy company.



A group of Missoula stakeholders and NorthWestern Energy employees discuss the options for combining our clean energy project with learning opportunities for the schools and communities. We believe that stakeholder involvement is critical to all our clean energy projects.

Focusing on energy conservation and recycling

Two key principles in our environmental policy are to promote our customers' efforts to conserve energy and to strive to minimize the generation of wastes and promote the reuse or recycling of materials.

Energy efficiency in our facilities

Across our three-state service territory, we maintain 158 buildings, ensuring they are safe, secure and as energy efficient as possible. One of our projects in 2017 was to replace the almost 100, single-pane windows in a 75-year-old office building in Butte, Montana. Our choice was to install operable, certified insulating-glass windows with exterior reflective glazing. Employees instantly noticed their offices were more comfortable, and we reduced the amount of energy needed to keep the building warm and cool for decades to come.

Other energy conservation measures we employ when feasible include insulating walls and ceilings, installation of high-efficiency boilers, and application of technology to regulate our HVAC systems, motors and pumps. We also are transitioning to LED lighting and occupancy sensors to control not only lighting but also heating and cooling systems.



John Habeger, Facilities manager, shows one of the new energy efficient windows and shade installed in the company's Energy Building in 2017.

Demand side management and energy efficiency

We have nearly 40 years of experience working with customers for the wise and efficient use of electricity and natural gas. We have offered energy efficiency programs, also known as demand side management (DSM) programs, to our customers since the late 1970s.

Montana customers fund energy efficiency as a least-cost resource in supply rates and through the USB charge. Our 2.5-year pilot program in South Dakota offering energy efficiency to residential, commercial, industrial, and irrigation customers ended December 31, 2016.

We continue to offer programs in Montana under the NorthWestern Energy sub-brand of Efficiency Plus, or E+. We have found that the most popular offerings are the rebates for high-efficiency commercial lighting and controls and the free, home-energy audits for space and water-heat customers. Through USB, we also award some incentives for small-scale renewable projects.

\$13.5M

In 2016, NorthWestern reported energy savings* totaled 49,684,125 kWh and 796,768 therms for a total cost of nearly \$13.5 million.

*We base all savings and expenditures on a July 1, 2015 – June 30, 2016 tracker year for Montana and for South Dakota. Currently, we do not offer energy efficiency programs to our South Dakota or Nebraska customers. Electric savings and expenditures include Montana small-scale renewables funded through the USB program. We fund additional Montana activities for local conservation, market transformation, research and development, and low-income bill and energy assistance with USB dollars as well, but these are not included in the expenditures.

Recycling at work



At NorthWestern Energy, we routinely recycle cardboard, aluminum cans, plastics, metals, electronics, used oil, lightbulbs and other utility equipment used at our numerous offices and work sites. However, we know we can always do better. As such, one of our 2017 Leadership NorthWestern teams took on the challenge of building awareness and providing training on work place recycling. The team prepared a video tutorial titled “Recycling with NorthWestern Energy” to reinforce our commitment to the environment and the wise use of resources. The tutorial covers how to avoid creating excess waste and what to do with materials ready for disposal. It focuses on reducing waste by storing files electronically, using reusable cups and coffee sticks, buying in bulk to reduce packaging, opting out of mailing lists that send junk mail, using reusable bags, and avoiding plastic water bottles. These are common-sense steps to keep our environment healthy and conserve natural resources. The team will share its completed video with all employees via our internal website.

Protecting the environment through stewardship & compliance

We believe that as NorthWestern Energy employees we each have a responsibility during the course of our work to protect the natural environment through conservation and sustainable practices. We also believe that we must conform to environmental laws, regulations, standards and other requirements such as permits and licenses.

Our environmental management system

In December 2016, Northwestern Energy began using an integrated environmental management information system called ECO System, allowing us to enhance greatly our environmental compliance efforts. Founded on best practices and tailored to the needs of our company, ECO System has provides us with automated task and action planning, reporting, data management, document control and retention, and event management.

Currently, we use ECO System to manage, document and track information such as:

- Environmental permits, conditions and requirements
- Inspections of underground storage tanks
- Title V air permit inspections
- Storm water pollution prevention inspections
- Spill prevention, control and countermeasure inspections
- Various unauthorized releases
- Bird mortality incidents
- Federal Energy Regulatory Commission correspondence relating to our hydro facilities
- Hydrocarbon sampling data
- Air emissions testing data
- SF6 annual reports



A lineman works to clear an osprey nest, reducing the chances of raptor mortality on and near our electric system.

Strong partnerships and our rivers

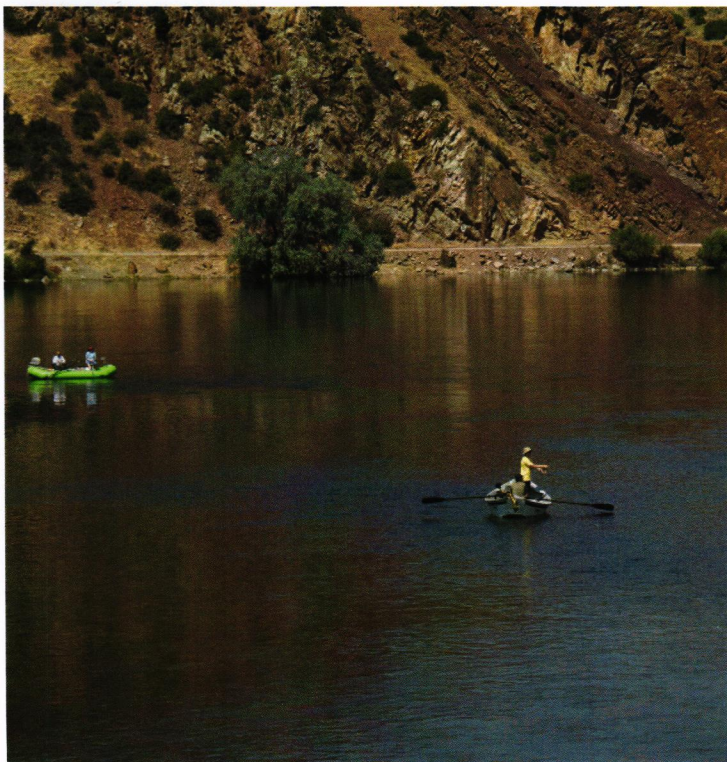
NorthWestern Energy operates 11 hydroelectric projects under three Federal Energy Regulatory Compliance (FERC) licenses. One of the licenses, FERC #2188 (the Missouri – Madison Project), includes nine dams extending 525 miles from Hebgen Dam just outside of Yellowstone Park to Morony Dam near Great Falls, Montana.

With agency and private partners, NorthWestern Energy uses an innovative approach to comply with the license requirements and manage the resources adaptively during the term of the license. Under a Memorandum of Understanding (MOU), NorthWestern, the U.S. Fish & Wildlife Service, Montana Department of Fish, Wildlife and Parks (MDFWP), U.S. Forest Service, the Bureau of Reclamation, and the U.S. Bureau of Land Management work collaboratively to implement studies and projects that protect, mitigate and enhance the Missouri-Madison Project's fish, wildlife, habitat and water quality. The MOU also includes a framework for decision-making and NorthWestern's annual funding obligation.

In 2016, we collaborated with seven different government agencies, 16 private landowners, six different non-governmental conservation groups and two state universities on 39 fish and wildlife projects. In addition, NorthWestern Energy provides private funds, which often serve as seed money to secure matching funds from state and federal grant programs. The 2016 funding from NorthWestern Energy leveraged an additional \$1.4 million in outside matching funds and in-kind donations, resulting in a total of \$2.6 million for river resource stewardship.



Robin McQuinn, of Billings, and Mark Killip, of Bozeman, plant cottonwood cuttings along the shore of the Missouri River across from the iconic white cliffs of Eagle Creek Campground. (Photo courtesy of Friends of the Missouri Breaks Monument)



Almost daily, one can find many anglers fishing on the Missouri River just below Hauser Dam.

**In 2016, NorthWestern Energy
provided
\$1.2 million
to support 39 fisheries,
wildlife and habitat
improvement projects within
the 550-mile corridor of the
Madison-Missouri River from
Yellowstone National Park to
the headwaters of Fort Peck
Reservoir**

Habitat improvement along rivers and tributaries

Habitat improvement on rivers and tributaries is a high priority for our protection, mitigation and enhancement program (PM&E). Funding from NorthWestern Energy and our many partners resulted in 13 different habitat improvement projects completed in the Madison and Missouri river drainages. These projects include streambank habitat restoration, stream crossing improvements, riparian area fencing and revegetation, streamflow improvement, wetland restoration, and restoration of cottonwood and aspen groves along the Missouri and Madison rivers and six tributary streams.

One of the more innovative habitat improvement projects involved cooperation with several partners, including the Lewis & Clark County Water Protection District, to complete a complex water exchange with local irrigators to prevent a three-mile section of Prickly Pear Creek in the Helena Valley from drying during the summer irrigation season.

Another significant part of the NorthWestern Energy program is to protect and enhance endangered species and species of special concern. We funded three projects to continue the ongoing program to maintain and expand populations of genetically pure native westslope cutthroat trout in the Madison and Missouri river drainages. Funds also supported recovery of endangered pallid sturgeon in the Missouri River and the release of more juvenile trumpeter swans with a goal of establishing five breeding pairs in the upper Madison River valley.

Fish and wildlife population monitoring is also an important part of our Protection, Mitigation & Enhancement (PM&E) program. NorthWestern Energy provides funding and assistance to MDFWP to conduct annual fish population surveys on the Madison and Missouri rivers and reservoirs. These annual surveys provide critical information for managing and monitoring the health of these nationally known fisheries resources.

The NorthWestern Energy program also funds research and special projects to understand and manage fish and wildlife resources better. Special projects included investigating beavers



The top two photos show researchers capturing one of the few remaining wild adult pallid sturgeons early this summer and transporting in the special holding tank to the Garrison National Fish Hatchery in North Dakota for spawning. (Photos by Steve Leathe) The bottom photo shows some of the more than 20 people who gathered south of Ennis, Montana, in September 2017 to watch the release of four, juvenile trumpeter swans at the O'Dell Creek wetlands. The release is part of a multi-year program involving NorthWestern Energy to increase the number of breeding pairs of trumpeter swans in suitable habitats.

and nesting bald eagles near Hebgen Reservoir in the Madison drainage. We also provided funding to conduct surveys of anglers in the Madison River and the Missouri River downstream from Hauser Dam to monitor the health of the fisheries and determine effects of angling on fish populations.

NorthWestern Energy has provided funding each of the last 10 years to support the installation and operation of a system of 12 remote fish-tracking stations located on a 225-mile stretch of the Missouri River from Great Falls to Fort Peck Reservoir. This tracking system is critical to understanding and monitoring movements of endangered pallid sturgeon and other species. Researchers monitored and tracked movements of 77 radio-tagged pallid sturgeon, 32 shovelnose sturgeon, 16 smallmouth buffalo and six northern pike.



Above, Casey Jensen, a fisheries technician with the Montana Department of Fish Wildlife and Parks, maintains a remote fish tracking station on the Missouri River within the Upper Missouri River Breaks National Monument. In recent years, we have assisted in population surveys and funded research on softshell turtles, a Montana species of special concern. Our employees worked with representatives from the Montana Department of Fish Wildlife and Parks and Montana State University during the summer of 2017 to obtain turtle-population density information in a 10-mile stretch of the Missouri River near Judith Landing. We will use this information as the baseline for long-term monitoring of population stability of this sensitive species. (Photos by Steve Leathe)

O'Dell Creek restoration

We began restoration of O'Dell Creek, a major tributary of the Madison River, in 2005 on the Granger and Longhorn ranches to rebuild critical trout spawning habitat and recreate one of southwest Montana's largest spring-fed wetlands. Since then, we have worked with many partners to restore more than 11 miles of the O'Dell Creek channel and 600 acres of connected wetland habitat.

Hay and livestock production have been the primary land use along O'Dell Creek since the early 1900s. In 1955, landowners excavated several miles of drainage canals that lowered the water table approximately four feet and drained nearly 1,200 acres of prime wetlands in order to increase hay production and livestock grazing. Restoration strategies have focused on filling drainage canals to restore the water table, restoring and rebuilding stream channels that were often over-widened due to heavy livestock grazing and restoring adjacent wetlands. Overly wide stream channels tend to provide very poor fish habitat because they become too shallow and warm and typically have very silty bottoms. Restoration work completed in 2016 resulted in restoration of 4,600 feet of stream channel and 4.9 acres of wetland habitat and this work is continuing in 2017.



Operators use heavy equipment to rebuild a section of O'Dell Creek.

Madison River flow management and monitoring

NorthWestern Energy operates Hebgen and Madison dams on the Madison River and works diligently with individuals and agencies to protect, mitigate and enhance fisheries, wildlife, water quality and recreation in the Madison River drainage to offset any effects of dam operations.

We conduct quarterly monitoring of 30 different water-quality parameters at four different locations along the Madison River in

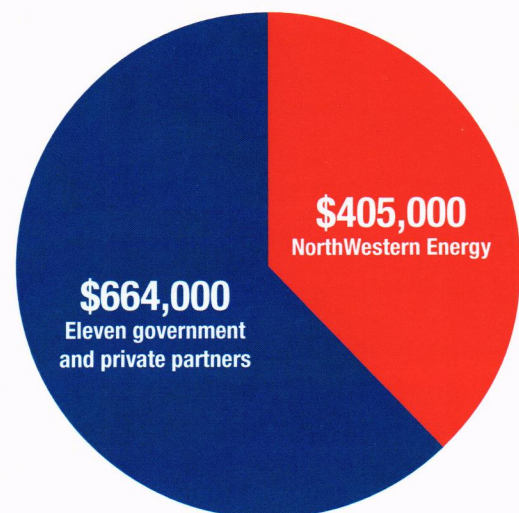
a program that has been ongoing since 1997. We monitor aquatic insect populations and benthic algae annually at four river stations and algae levels in Hebgen Lake closely each summer. We also implement an intensive river-pulse flow management program each summer to reduce water temperature in the lower Madison.



Within a few years of restoration, sections of O'Dell Creek boast increasing populations of fish and birds along with the return of native vegetation.

We conduct quarterly monitoring of 30 different water-quality parameters at four different locations along the Madison River in a program that has been ongoing since 1997. We monitor aquatic insect populations and benthic algae annually at four river stations and algae levels in Hebgen Lake closely each summer. We also implement an intensive river-pulse flow management program each summer to reduce water temperature in the lower Madison.

\$1.1 M devoted* to Madison River conservation in 2017



*Key projects include restoration of native westslope cutthroat trout in two tributary streams, aquatic habitat improvements in three tributaries, and extensive fish population monitoring.

The Missouri-Madison Recreation Trust

NorthWestern Energy participates in a public-private partnership River Trust Fund to meet public recreation needs along the Madison and Missouri rivers. The Missouri-Madison River Fund, a \$6.7 million trust fund for public recreation, was created through the collaborative efforts of NorthWestern; Montana Fish, Wildlife & Parks; U.S. Forest Service; U.S. Bureau of Land Management; Madison, Gallatin, Broadwater, Lewis & Clark, Cascade and Chouteau counties; and numerous other public and private partners.

This year marks the 11th year in which recreation improvement projects received earnings from the trust through the River Fund program. Since 2007, the River Fund and NorthWestern Energy have awarded nearly \$4.7 million in support of 97 projects totaling nearly \$7.5 million in recreation enhancements in the Missouri-Madison corridor.

- Replacing of a boat ramp at McAtee Bridge fishing access site on the Madison River
- Installing an electric gate at Giant Springs State Park in Great Falls
- Building a maintenance building at Giant Springs State Park in Great Falls
- Paving the approach at the entrance to Black Sandy State Park on Hauser Lake
- Completing phase two of a drinking water system at Palisades Recreation Area on the Madison River
- Revising and printing the Hebgen Lake bathymetric map
- Rehabilitating trail segments at West Bank Park in Great Falls
- Constructing a shelter along the River's Edge Trail near the south end of Cochrane Dam in Great Falls
- Upgrading information kiosks at four Fishing Access Sites along the Missouri River
- Performing site upgrades to Causeway Fishing Access Site near Hauser Lake
- Rehabilitating the first span of the historic walking bridge over the Missouri River in Fort Benton

Created as a public-private partnership to meet public recreation needs along the Madison and Missouri rivers, the River Fund supports ongoing efforts to protect and enhance recreation. The River Fund awards for qualifying projects will continue annually, with grants awarded each December.



Pictured here are two of the hundreds of visitors who enjoy the Ryan Island day use area that features picnic areas, walking trails and a pavilion that is open to the public. (Photo by Kim Bergstrom, Pinnacle Research)

NorthWestern Energy and the Missouri-Madison River Fund granted 2017 funding awards for 11 public recreation improvement projects on the two rivers where the company operates nine of its 11 hydroelectric facilities. A combination of \$62,481 from NorthWestern Energy and \$363,123 from the Missouri-Madison River Fund along with \$150,424 from agency and private partners allowed completion of projects totaling \$576,028. In addition, NorthWestern Energy contributed more than \$437,000 for operation and maintenance efforts at 32 existing recreation sites in 2017 as required by the Project 2188 (Madison-Missouri River) FERC License. Funded recreation projects for 2017 include:



Boaters and other recreationists enjoy Black Sandy State Park, especially during the summer. (Photo by Elizabeth Stender)

Thompson Falls fish passage

In northwestern Montana at the Thompson Falls hydroelectric facility, NorthWestern Energy operates an upstream fish passage ladder and engages in habitat conservation projects as part of the Thompson Falls FERC hydroelectric license. This includes projects to address bull trout, a threatened species listed under the Endangered Species Act.

As our fisheries biologists have learned to fine-tune the operation of the fish ladder, the total number of fish collected has increased from 1,805 fish in 2011 to a high of 11,647 fish in 2015. Since 2011, we have released 30,165 fish upstream of our Thompson Falls dam. Fish enter the ladder and swim up through 45 individual steps (about 1.1 foot each) toward the top of the facility where they enter a holding pool that prevents them from swimming back down the ladder. Each day from March to October, biologists operate a horizontal fish “crowder” that guides fish in the holding pool to a fish lock. The lock is sealed and biologists then pump water into the lock to lift the fish 17 feet to a

sampling platform where they carefully sort and handle each fish, collecting and recording data on species, numbers, condition and other pertinent data.

The fish ladder is dewatered and maintained during the winter months when bull trout typically migrate in the main Clark Fork River. We have recorded 17 different species of fish, including eight trout species, walleye, small and largemouth bass and six native species using the ladder. Although bull trout are rare in the project site, the ladder is effective in passing bull trout migrating upstream.

The fish ladder is one component of an overall program to restore ecological connectivity for fish in the Clark Fork River basin. Once upstream of Thompson Falls, fish have access to miles of free flowing river and tributaries known to be bull trout spawning streams that previously were inaccessible to fish in the lower Clark Fork River.



NorthWestern's Brent Mabbot, senior hydro compliance professional, monitors fish activity on one of the fish ladder steps at our Thompson Falls dam.

Blue algae monitoring

Blue-green algae (cyanobacteria) blooms sometimes occur at Hebgen Reservoir near West Yellowstone, Montana. There have been reports of algae outbreaks in 1977, 1985, 1986, 1987 and 1988 as well as reported deaths of several cattle and pets dying after drinking lake water. Cyanobacteria have the potential to produce toxins that attack the liver, the nervous system, or irritate skin and eyes. Exposure to these toxins can range from mild irritation to long-term organ damage to severe lethal doses causing death.

The environmental conditions that produce the toxins resulting from cyanobacteria are unknown. To limit risk to the public, livestock and wildlife, NorthWestern Energy cooperatively manages a monitoring and public notification program in conjunction with the U.S. Forest Service, Gallatin City-County Health Department, Department of Environmental Quality, Montana Fish, Wildlife and Parks, and the U.S. Bureau of Land Management. The goal of the program is to identify toxic

conditions in Hebgen Reservoir and to notify the public of the location and severity of these conditions.

In late September 2016, a significant bloom occurred where cyanobacteria was driven and concentrated on the north end of Hebgen Reservoir. The cyanobacteria ranged from bright green to turquoise in color and accumulated in bays and marinas.

NorthWestern Energy tested and found toxin concentrations ranging from slightly to severely harmful. We worked with our partners to notify the public through information distributed at local marinas, fly shops, radio stations and newspapers. In response, the Gallatin City-County Health Department issued warnings on the north shore of Hebgen Reservoir. We continued to monitor conditions in the reservoir and found the toxins persisting until late October. Warnings remained in effect until ice formed on the lake. Because of this organized communication and monitoring effort, we received no reports of harmful exposure to humans or animals.



A blue-green algae bloom is visible along the shore near the Happy Hour Marina on Hebgen Lake in September 2016. (Photo by Andy Welch)

Invasive mussels

In October 2016, water samples taken from Canyon Ferry and Tiber reservoirs in Montana found veligers, which are larval forms of zebra and quagga mussels that float in the water. This was a first for Montana waterways. Since then, the Montana Fish Wildlife and Parks has sampled Fresno, Holter, Hauser and Fort Peck reservoirs along with Lake Frances and the Missouri, Marias and Milk rivers, finding them free of the invasive species – so far.

Mussels attach to natural or manmade hard surfaces like rocks, concrete, docks, boats and submerged components of a hydropower facility. In addition to forming attached colonies, mussels also filter the suspended particles from water encouraging growth of aquatic plants and altering the entire ecosystem of a waterway. Large colonies of mussels also deplete oxygen in water, increasing the water's pH and potentially increasing the release of toxins.

In response to the finding of the mussel larval in Montana, the governor issued an executive order declaring a natural resource emergency on Montana waterways. The order made \$750,000 in special state funding available and triggered the deployment of a Mussel Incident Response Team to coordinate a response and communications. NorthWestern Energy established its own Incident Response Team for the same purposes and has active and qualified representation on the state's Invasive Species Task Force. We also are tracking the state's management activities, legislative proposals and funding strategies and we increased a focus on mussels in our ongoing water quality and biological monitoring efforts. In addition, we have trained our dam operators to inspect for presence of mussels or larva.



Invasive mussels attached to a branch that had been under water. Zebra mussels are relatively small (typically the size of an adult fingernail) with thin shells of variable coloring, often with stripes or zigzag patterns. Quagga mussels are usually light tan to off white, with narrow stripes and are fan shaped and rounded, and typically are larger than the zebra mussel.

Avian protection program

Every spring golden eagles soar across parts of our service territory. Thanks to a national collaboration that started more than three decades ago resulting in guidance documents prepared by the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and the United States Fish and Wildlife Service (USFWS), NorthWestern Energy has a program in place to reduce the risk of an eagle striking a powerline or being electrocuted.

We followed the APLIC Avian Protection Plan Guidelines to develop a company-specific Avian Protection Plan (APP). The APP applies to all of utility operations but in particular focuses on overhead electric lines. In accordance with the APP, we build new lines and retrofit existing lines with bird protection devices to meet APLIC recommended guidelines in areas likely to attract birds, reducing the risk of electrocutions. We also focus on isolating or insulating energized grounded equipment and wires.

Like almost all utilities, we have more miles of existing power lines than new power lines, meaning our greatest risk is that current structures lack adequate clearance to protect birds. Options we use include reframing to raptor-friendly standards, installing protective covers on equipment pole-top equipment and sections of line.

We reduce the risk of bird and line collisions by siting new lines to avoid areas preferred by birds especially near wetlands. We also install line-marking devices on new and existing lines to increase visibility of the lines and reframe or redesign lines as appropriate.

Unfortunately, power poles offer nesting opportunities for large birds like osprey. The nests may cause outages, resulting in a flashover that could a nest fire and even a wildfire. NorthWestern Energy has installed hundreds of separate osprey platforms to protect the electric system and provide the large raptors with a safe place to nest.

As recommended in APLIC guidance documents, we collect information on bird mortalities on our system. This allows us to identify problem configurations, evaluate the effectiveness and employ changes as needed to reduce the risk of additional bird mortalities.



Researchers conduct a post-construction inspection of 160-by-160 meter plots around each of our 25 wind turbines, looking for signs of bird collisions with the turbines.



Pictured above a NorthWestern Energy employee along with representatives from Montana Fish Wildlife & Parks evaluate and record the decay rate of an intentionally placed bird carcass as part of an extensive bird and bat study underway at our Spion Kop wind farm.



On the left, one of our linemen clears an osprey nest of bailing twine, pieces of barbed wire, bones and other items that can be fatal to the raptors and their chicks. The spring-cleaning took place at several nests just south of Canyon Ferry Lake and before the osprey lay their eggs in the nests. The effort not only makes the nests safer for returning osprey, but it also reduces the likelihood of osprey damaging nearby powerlines and causing outages. Every year, we get calls to rescue tangled and dangling osprey. We not only try to clear nests of bailing twine but we also spread awareness of the issue through articles in our bill inserts.



Sam Milodragovich, our senior biologist and permit specialist, holds the distinguished service award he received from the Montana Chapter of The Wildlife Society in 2017. The organization honored Sam for his "steadfast commitment to wildlife conservation."

Environmental permitting

NorthWestern's environmental permitting program focuses on limiting impacts of construction and maintenance activities on air, water and land resources through compliance with local, state, federal and tribal environmental regulations. We construct, operate and maintain our facilities only after the appropriate permits are in place.

We work with various agencies to obtain numerous permits for any project that may affect streams, rivers, wetlands or floodplains. Our Environmental Permitting and Compliance professionals review company projects during the design phase, determining the needed permits before any work can begin. They then prepare permit applications and act as the liaisons between the permitting authority and our engineers or construction project managers. Many permits include conditions to which we must comply during construction.

Construction Permits by Operating Department 2016

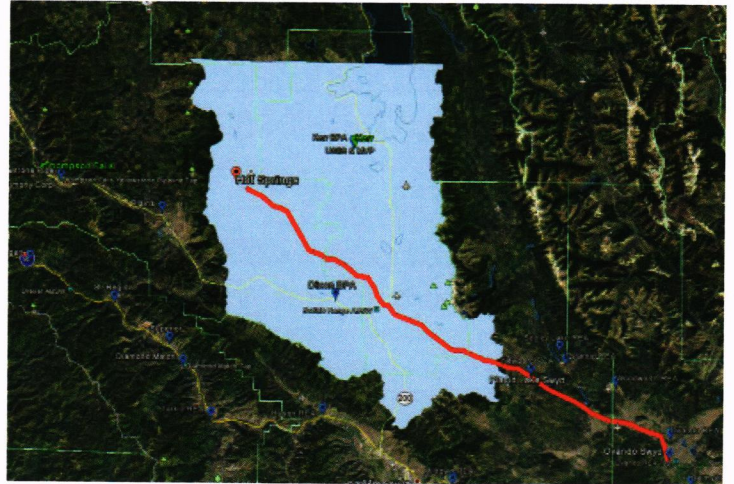
Montana	310	318	404/401	Floodplain	SWPPP**	Tribal	Sage Grouse
Electric Transmission	9	5	2	2	1		2
Electric Distribution	1	1	2	1	4		3
Gas Transmission	3	1	1	2	2	1	
Solar					1		
Hydro	1	1		1			
Substations					1		
South Dakota							
Substations					1		
Totals:	14	8	5	6	10	1	5

Cultural resource management

Part of our environmental stewardship involves the identification and protection of cultural resources in proximity to our infrastructure. We work closely with the Confederated Salish and Kootenai Tribes' (CSKT) Tribal Preservation Office (TPO) to support the renewal of a right of way easement across the Flathead Indian Reservation for a 230 kV transmission line. Under a Programmatic Agreement with the Bureau of Indian Affairs, CSKT, Salish-Pend d'Oreille Culture Committee, Kootenai Culture Committee, Tribal Historic Preservation Officer, TPO and Tribal Lands Department, we funded a Viewshed Analysis, Class I and Class III cultural inventories of the transmission line right of way and an Ethnographic Study. These studies revealed that the transmission line is located within the direct or indirect area of potential effect of many cultural or religious sites.

The jointly developed Cultural Resource Treatment Plan (Plan) ensures that ongoing operation and maintenance of our powerline does not affect these important sites adversely. The Plan includes monitoring, notification, restrictions on tree clearing in some areas, access limits, emergency repair procedures, unanticipated discovery plan, reporting and worker awareness training. As

such, close to 20 NorthWestern Energy construction managers, engineers, surveyors, construction crews and lands personnel attended training on the Plan and cultural sensitivities of the tribe. The session was a combined effort between our staff and members of the CSKT preservation office.



Our Hot Springs to Ovando 230 kV transmission line crosses the Flathead Indian Reservation as indicated on the map.

Vegetation management



Scott Bernhardt, NorthWestern's manager – Vegetation Management, works with contract crews clearing roughly 30 miles of right of way for the Thompson Falls-to-Kerr reliability compliance project this autumn.

Over the years, NorthWestern Energy has developed and executed an Integrated Vegetation Management (IVM) plan critical to the reliability of our electric system. The IVM plan encourages low-growing, productive native vegetation that increases electric system reliability, reduces tree-trimming costs, provides vegetation preferred by many species of wildlife and improves the landscape.

The company has 7,200 miles of electric transmission right of way (ROW) and about 15,000 miles of electric distribution ROW in Montana. These corridors vary from 10 to 75 feet on each side of the line depending on the voltage. Many of these electric lines pass through forested areas. On a regular and rotating schedule, NorthWestern Energy trims tree branches and removes trees inside and outside the ROW that affect the operation of the electric lines.

NorthWestern Energy employs seven full-time arborists and vegetation management technicians who, together with contractors, control trees and noxious weeds in our ROWs and around other facilities like substations. Working in accordance with Montana's County Noxious Weed Act, our IVM plan employs mechanical, chemical, biological and cultural techniques to inhibit weed growth, resulting in prime habitat for wildlife and native species of ground cover.

Addressing our manufactured gas plant sites

From the early 1800s until the 1950s, prior to the availability of natural gas, communities relied on manufactured gas – or town gas – to produce fuel for street lamps, cooking, heat and lights. During this time, at least 1,500 manufactured gas plants (MGP) operated within the U.S., including several in our service territory. In the 1930s, utilities began installing natural gas pipelines gradually eliminating the need for MGPs. A by-product of the gas manufacturing process was coal tar, a black substance that has a viscosity and appearance similar to driveway sealer. Typically,

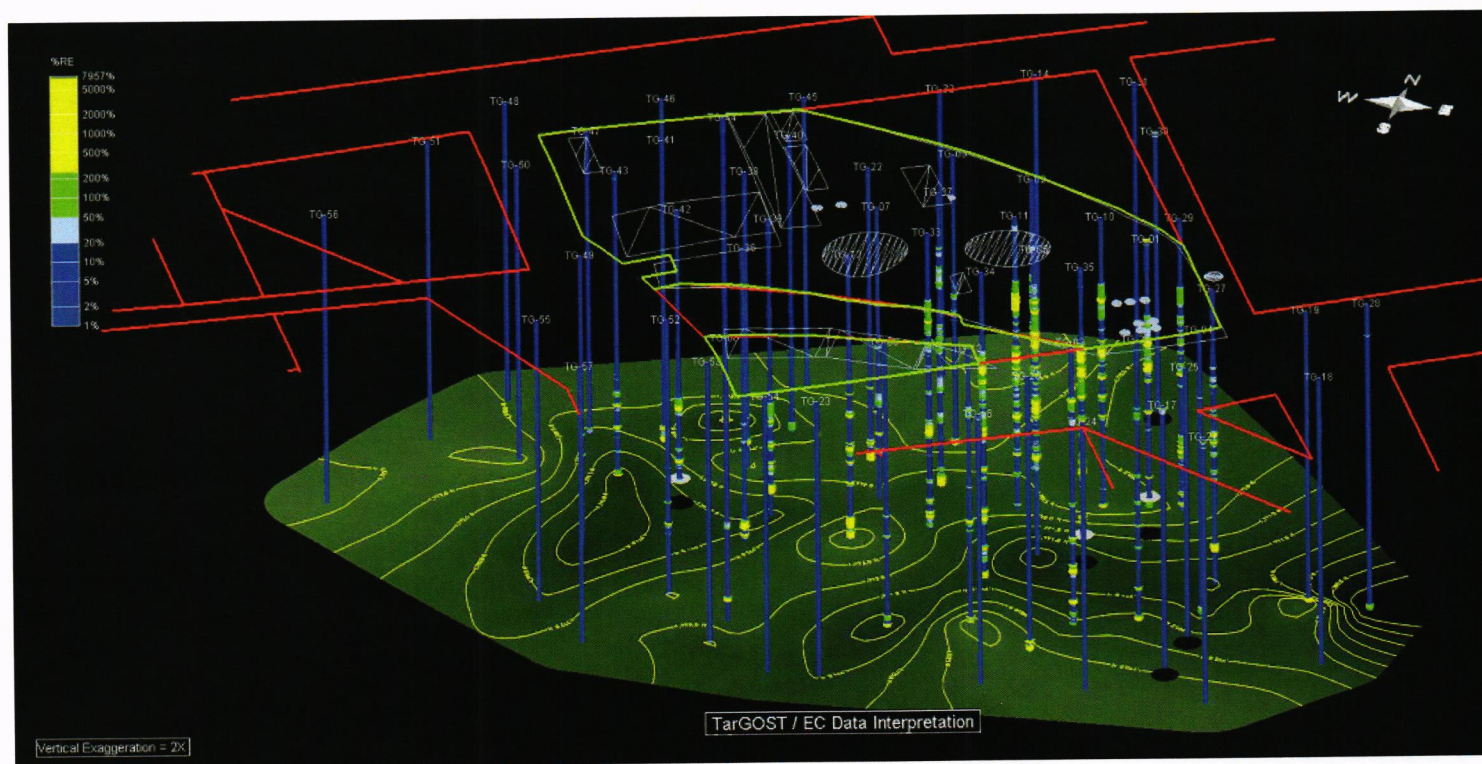
operators burned the coal tar in a generator, used it at the plant sites or sold it for use in manufacturing preservatives, coatings, resins and other products. Unfortunately, MGP sites released coal tar into the environment at many sites. Today, we are working diligently to address the environmental impacts associated with our predecessor companies' operation of former MGPs at three sites in Nebraska, three in Montana and one in South Dakota.

Nebraska MGPs

Our predecessor companies operated MGPs in North Platte, Kearney and Grand Island. We work at all three sites using state of the art technology to characterize the nature and extent of impacts associated with former MGP operations. Two technologies -- Tar-specific Green Optical Screening Tool (TarGOST®) and ground penetrating radar (GPR) – in particular have been very useful for our investigations.

TarGOST, works by taking advantage of the fluorescent properties of coal tar. A tool with a sapphire window is pushed through the soil column and emits pulses of laser light, which shine on the

soil touching the window. If fluorescent molecules are present, a fiber optic cable captures the fluorescence that is processed in an analyzer at the surface of the ground. Using this tool, we efficiently map the vertical and lateral extent of coal tar impacts. After we use TarGOST at various locations across a site, we load the TarGOST results into visualization software. Using the visualization software helps us understand the impacts in three dimensions and aids in determining where to place soil borings and monitoring wells, and ultimately an optimal approach to remediate the site.



A snapshot from the visualization software shows the blue vertical lines where the TarGOST® tool pushed through the soil. The yellow bands indicate areas of impacts and the green surface at the bottom shows the topography of a confining clay layer about 80 feet below ground surface.

South Dakota MGPs

The Aberdeen Gas Company, one of our predecessor companies, operated a MGP from 1888 to 1926 near the intersection of First Avenue NE and Jackson Street in Aberdeen, South Dakota. We have owned this location since 1926 and razed the structures associated with the MGP operations in 1946. Coal, delivered by rail, was the main raw material for the Aberdeen MGP near what is now Browne Park. The rail bed remains and now serves as a bike path for the community.

Historically, some coal tar entered municipal storm and sanitary sewer lines with residual coal tar entering a city storm sewer that runs through the NorthWestern Energy property over to Moccasin Creek. In 2006, NorthWestern Energy constructed a treatment

system to handle this water, eliminating ongoing releases of coal tar to this storm sewer.

In 2007, we removed the creek sediments affected by this old discharge. We lined a sanitary sewer pipeline running north of the Aberdeen MGP site in 2008 to prevent coal tar from infiltrating into the pipe through leaking joints and flowing to the municipal wastewater treatment facility. In 2011, we began collecting coal tar after we installed engineered collection trenches.

We continue to work with the South Dakota Department of Environment and Natural Resources on the Aberdeen MGP site cleanup as we make improvements to the water treatment system and design additional coal tar removal projects.

Montana MGP sites

The former MGP sites in Butte and Helena are on the Montana Comprehensive Environmental Cleanup and Responsibility Act (CECRA) list. For these sites, the Montana Department of Environmental Quality (DEQ) has accepted our voluntary Cleanup Plans per the Voluntary Cleanup and Redevelopment Act (VCRA). Although, the Montana DEQ did not add the Missoula, Montana, MGP site to the CECRA list, we perform site assessment and environmental monitoring activities consistent with the other two MGPs to assess the impacts of the former MGP operation.

NorthWestern Energy performs ongoing groundwater monitoring at the Helena, Butte and Missoula MGP sites. For the past several years, we have performed consistent semi-annual groundwater monitoring at all of these sites. The objective for groundwater monitoring has been to determine the concentration of constituents of concern in groundwater and continuously monitor to ensure that contaminants do not pose a risk to human health.

Due to its successful implementation at the Nebraska and South Dakota MGP sites, we are exploring the TarGOST technology as a potential tool for providing a more extensive and detailed characterization of the Helena MGP site. To help guide placement of TarGOST application locations, we used another technology known as ground penetrating radar (GPR) to model the subsurface features beneath the historical footprint of the facility. GPR scan will be used primarily to identify the presence or absence of known or conjectured underground features that may remain from MGP operations. GPR is especially useful at this site because the location of two gasholders was previously identified, and as such will function as comparative reference features for the rest of the site.



Ty Deebo, a contract driller, uses a Geoprobe® to push sensors into the ground near our service center in Helena.

Polychlorinated biphenyls (PCB) management

NorthWestern Energy routinely tests any equipment that may contain polychlorinated biphenyls (PCBs), which is an organic chlorine compound once widely used as dielectric and coolant fluids in electrical equipment. PCBs are highly toxic and classified as a persistent organic pollutant and as a carcinogen. Because of this, the U.S. Congress banned the production of PCBs in 1979 followed by a ban endorsed by the Stockholm Convention on Persistent Organic Pollutants in 2001.

Dielectric fluid is tested in any equipment manufactured before the PCB ban or might contain of oil-filled components (e.g., bushings on a transformer) that are known or suspected to have been manufactured before to the PCB ban. We label and replace or refurbish, if necessary, any equipment found to contain PCBs.

NorthWestern Energy employees also perform Clor-n-oil tests in the field to provide real-time information to help direct emergency cleanup work or to provide information during the initial stages of project planning. We follow up the field tests with appropriate sample collection and analyses by a laboratory.

The transformer shops in Montana and South Dakota routinely test transformers brought in for extensive maintenance or retirement. Test results associated with these transformers are logged in a database and available for future reference. Any time we encounter a leaking transformer, we query the serial number in this database, giving associate PCB testing results to the responding line crew. When transformers come into the shops containing PCBs, we retro-fill them with non-PCB oil using an EPA-approved procedure. We can return retro-filled transformers to use after we complete the process ensure record the appropriate documentation including PCB testing results for the retro-filled transformers in the database.

NorthWestern Energy's PCB equipment tagging codes	
Color	PCB Concentration
Blue*	Non-PCB oil as certified by manufacturer
White	No trace of PCBs
Green	Trace – 49 ppm
Yellow	50 – 499 ppm
Red	500 ppm or more
*Note: Manufacturer tags or metal plates indicating the equipment is non-PCB is sufficient.	

Hazardous waste management

The proper identification of hazardous materials and management of hazardous waste generated during on-going utility operations prevents effects to human health and the environment. Over several years, NorthWestern Energy has dramatically reduced use of hazardous materials and therefore the generation of hazardous waste. We have also developed a Waste Management Plan to provide guidelines that employees can implement to manage common hazardous and non-hazardous waste streams safely and efficiently.

For the most common waste streams, the plan defines common types of a specific waste as well as container, labeling, storage and disposal requirements along with record-keeping and waste minimization recommendations. Employees throughout our service area adhere to the guidance provided by the Waste Management Plan and our environmental staff provides expertise for special situations. The group also tracks and reports on applicable state and federal documentation requirements, which includes the Environmental Protection Agency form 8700, to ensure ongoing compliance during process or operational changes at specific facilities.



Beth Stimatz, Environmental Compliance specialist, collects soil samples to ensure oil cleanup was complete after a severe winter storm in northern Montana toppled numerous power poles with transformers.

Oil spill prevention measures

NorthWestern Energy works hard to anticipate, prepare for and avoid occasional spills or an unpermitted release to the environment. To help prevent and prepare for oil spills, we have plans that address the EPA's Spill Prevention, Control and Countermeasure (SPCC) rules for facilities where we have equipment filled with more than 1,320 gallons of oil in locations near navigable waters. These plans identify the operating

procedures to prevent spills, secondary containment requirements and countermeasures to contain, cleanup and mitigate the effects of an oil spill. Our environmental staff reviews the plans regularly to ensure they are up to date and compliant with the regulations and conduct routine facility inspections. We also provide response training for our employees to ensure they are prepared to execute specific measures.



In July 2017, employees respond to a mock oil spill at Hauser Lake as part of our emergency response plan annual training. At our Hauser facility, employees practiced launching their boat and deploying booms. The response drills were timely as demonstrated by the actions of employees at the Morony Dam. When crews were conducting preventative maintenance, they found a small amount of lube oil released in the water below the dam. The employees responded quickly and their actions prevented any additional oil from reaching the water and kept the released oil from traveling further downstream. Because of their training, they knew the steps to take. They immediately deployed oil absorbing pads and booms into the waterway and proceeded to empty the leaking gearbox to eliminate release of additional oil.

Air quality controls

Dave Gates Generating Station

NorthWestern Energy operates the Dave Gates Generating Station (DGGGS) in Anaconda, Montana. The 150-megawatt (MW) natural gas facility serves as a regulating resource to stabilize the transmission grid due to supply and load variations and the integration of unpredictable fluctuations from intermittent renewable resources, such as wind and solar power. DGGGS consists of three, 50-MW generating units with each generating unit consisting of two aero-derivative combustion turbines and one electric generator.

We control carbon monoxide (CO) and volatile organic compounds (VOCs) by catalytic oxidation. Nitrogen oxide (NOx) emissions are controlled using water injection and selective catalytic reduction (SCR). Through the system, we inject demineralized water into the turbines by cooling the combustion temperature thereby reducing the formation of thermal NOx. We reduce NOx even further when the SCR injects aqueous ammonia across the face of the NOx catalyst, converting nitrogen oxides to nitrogen and water vapor. We monitor emissions with continuous emissions monitoring systems (CEMS). The CEMS measures the stack emissions and

provides feedback to the SCR to optimize ammonia injection rates for better NOx reduction and preventing over injection of ammonia.



Jason Boeckel, compliance coordinator at our Dave Gates Generating Station, looks at emission monitors located the top of one of the three stacks at the site.

Aberdeen Generating Station

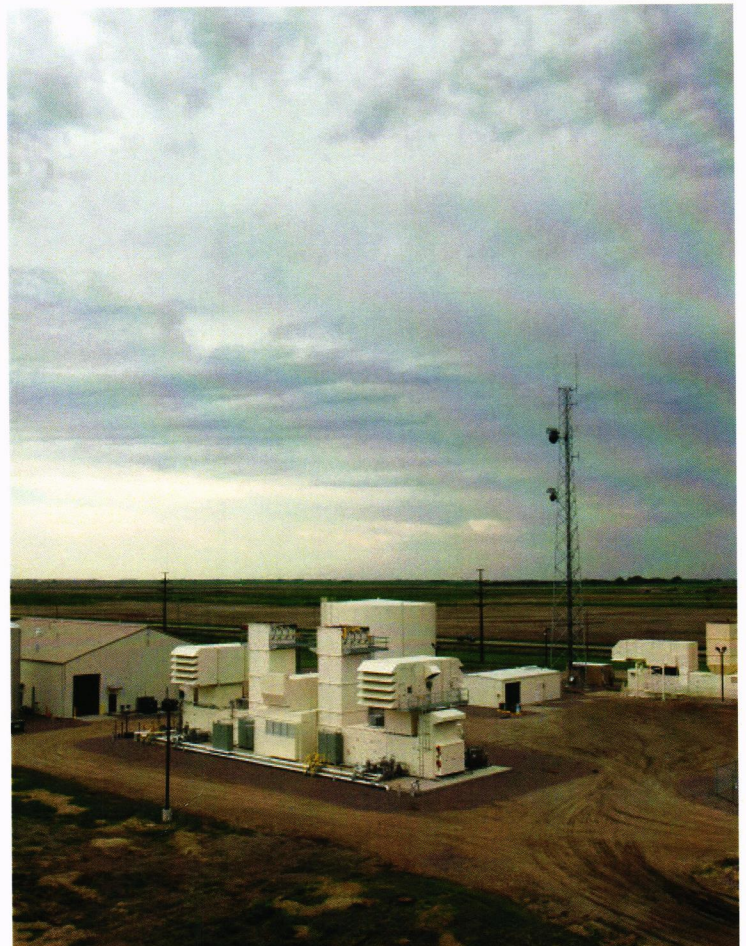
The Aberdeen Generating Station located in Aberdeen, South Dakota, is a peaking facility. The site has two units. Historically, we used the facility during extreme heat or cold or as a backup supply for renewable generators in the area. In 2016, the facility joined a new power pool and marking group and since then we have dispatched the units, especially Unit 2 because it is the newest and most efficient, to run more frequently.

Unit 1 is an existing 1976 GE Frame 5 simple cycle, fuel oil-fired combustion turbine capable of generating 27 MW. The unit does not have any emissions controls and typically operates less than 200 hours per year.

Unit 2 is a Pratt & Whitney Power Systems FT8-3 Swiftpac simple-cycle combustion unit with a maximum output of 60 MW. The Swiftpac contains two aero-derivative combustion turbines – Units 2A and 2B.

These units can operate on pipeline natural gas or ultralow sulfur No.2 fuel oil. Pipeline natural gas is the fuel of choice for normal operations and startup. Individual gas and liquid fuel flowmeters at each turbine measure fuel flow for calculation of heat input to determine compliance with 40 CFR Part 60 and AQCP emission limits.

Units 2A and 2B use water injection for the control of NOx emissions. The Continuous Emissions Monitoring Systems (CEMS) provide real-time data.



Our Aberdeen Generating Station in Aberdeen, South Dakota.

Gas Transmission/Production air quality

In 2017, the Gas Transmission/Production department worked toward reducing the air emissions at two compressor stations, Telstad and Blaine County #1 (BC1). Both compressor stations were overhauled, removing engines and replacing them with efficient models. We also installed new equipment to help reduce emissions.

The BC1 compressor station was also on regional haze list. We worked with the EPA to correct and update BC1 haze information. As a result, the agency removed the BC1 compressor station from the regional haze list.

In our work to improve the reduction of greenhouse gas, we conduct leak surveys every two years. We did find two leaks and repaired them immediately. We also conduct monthly surveys at the plants to ensure there are no leaks from the plants. In addition, the initial methane survey at our new Meriwether Compressor Station detected no leaks.



Two cranes lift a compressor package at our new Meriwether Compressor Station north of Cut Bank, Montana. (Photo by Mark Schneider)



Havre mechanic Jake Phillips tunes one of the Caterpillar engines as part of the BC1 upgrade project. (Photo by Craig Smith)

Contact us

NorthWesternEnergy.com

CONNECT WITH US



Corporate Support Office

3010 W. 69th Street
Sioux Falls, SD 57108

Montana Operational Support Office

11 East Park
Butte, MT 59701-1711

South Dakota/Nebraska Operational Support Office

600 Market Street West
Huron, SD 57350

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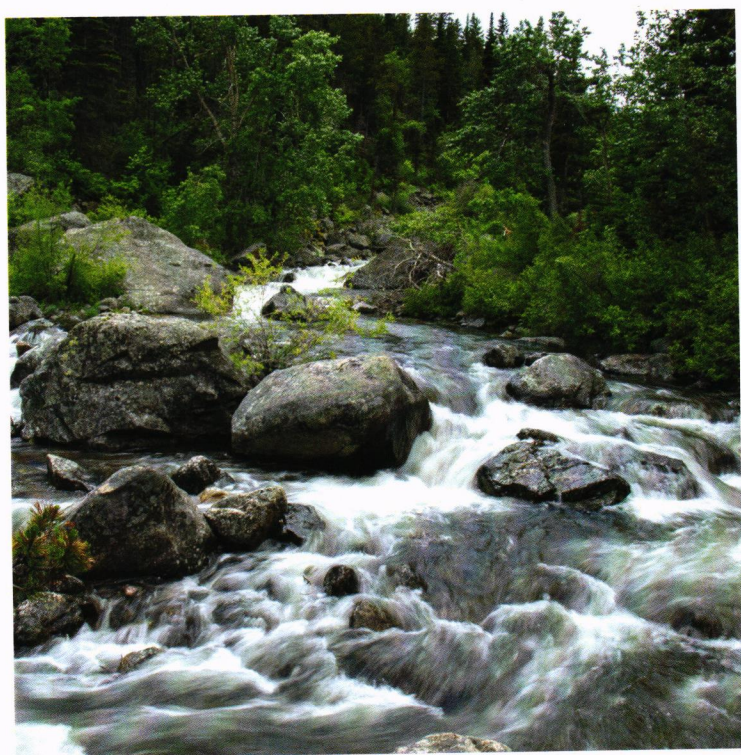
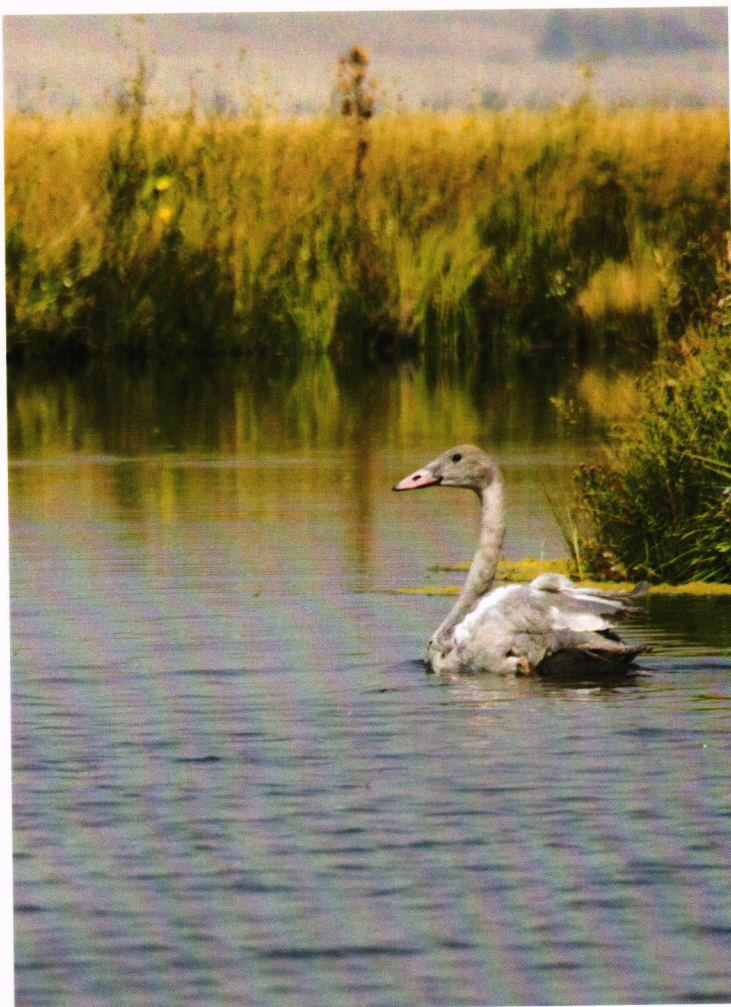
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To request additional copies, contact:

NorthWestern Energy
Creative Services
11 East Park
Butte, MT 59701



Top photo shows one of the newly released trumpeter swans in an O'Dell Creek wetland area. On the far left is a photo of the West Rosebud Creek below our Mystic Lake dam. The bottom right-hand shows two employees visiting with a contractor at a right of way tree clearance project.



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